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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,051	01/28/2004	Malte Kumkar	15540-020US1 / 25 216 RK/	9616
26171	7590	04/11/2006	EXAMINER VAN ROY, TOD THOMAS	
FISH & RICHARDSON P.C. P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			ART UNIT 2828	
			PAPER NUMBER	

DATE MAILED: 04/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

<b>Office Action Summary</b>	<b>Application No.</b> 10/765,051	<b>Applicant(s)</b> KUMKAR ET AL.	
	<b>Examiner</b> <i>r j</i> Tod T. Van Roy	<b>Art Unit</b> 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 15 February 2006.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☒ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Drawings***

The drawings were received on 02/15/2006. These drawings are accepted.

### ***Response to Amendment***

The examiner acknowledges the amending of claim 1.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-15 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

Art Unit: 2828

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-2, 4-5, 7 and 13-15 are rejected under 35 U.S.C. 103(a) as being anticipated by Byren (US 6014391) in view of Tidwell (WO 93/23899, applicant submitted art).

With respect to claims 1-2, Byren teaches an apparatus for optically pumping a laser-active solid body with pumping light coupled into the solid body through an end surface of the solid body (fig.1), the apparatus comprising: a laser-active solid body (fig.1 #4) including an end surface through which pumping light is coupled into the solid body (fig.1 #4 right side) and a lateral surface through which pumping light exits the solid body (fig.1 #4, top and bottom lateral surfaces); a reflector surrounding the laser-active solid body at a distance from the lateral surface of the solid body for reflecting light that exists the solid body back towards the solid body (col.5 lines 56-58, coating); thereby forming an annular gap between the solid body and the reflector (gap formed between body #4 and reflecting surface #5, gap filled with material #3). Byren does not teach a surface for diffusing light. Tidwell teaches an end pumped solid state laser with a surface (lateral) for diffusing light (pg.5 lines 1-6 coating, or roughed surface pg.5 lines 8-10). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the end pumped laser of Byren with the end pumped system with diffusely functional coating, or roughed laser media of Tidwell in order to more evenly distribute pumping radiation within the lasing medium (Tidwell, pg.5 lines 1-6).

With respect to claim 4, Byren teaches the reflector has a mirror like reflecting smooth surface for reflecting the exiting pump light (col.5 lines 55-62, the applied coating and hyperbolic surface would be smooth in order to properly couple the reflected light back to the gain media).

With respect to claim 5, Byren and Tidwell teach the apparatus as outlined in the rejection to claim 1, but do not teach the surface for diffusing light is the surface of the reflector. Tidwell does teach a reflective coating which has diffusive properties. It would have been obvious to one of ordinary skill in the art at the time of the invention to replace the reflective coating of Byren with the reflective diffusive coating of Tidwell in order to more evenly distribute pump radiation back towards the laser media (Tidwell, pg.5 lines 1-6).

With respect to claim 7, Byren and Tidwell teach the lateral surface of the solid body has a mirror like smooth surface (when diffusive surface is prepared with coating, rather than surface roughening, the solid body would have a smooth finish).

With respect to claims 13-15, Byren and Tidwell disclose the apparatus including all of the limitations in claim 1, but do not teach the amount of light which is diffused. It would have been obvious to one of ordinary skill in the art at the time of the invention to choose the amount of diffused light to be 3, 20, or 40 percent as it has been found to be not inventive to discover the optimum, or working, range by routine experimentation (see MPEP 2144.05 II A - In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

Art Unit: 2828

Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Byren in view of Tidwell in view of Honea et al. (US 2002/0118718).

With respect to claim 8, Byren and Tidwell teach the apparatus as described in the rejection to claim 1, including a medium disposed on the outside of the lateral surface (Tidwell, pg.4 lines 28-30), but do not teach the medium to be of a higher refractive index. Honea teaches a solid state pumping apparatus that uses a medium of high refractive index ([0006]). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the apparatus of Byren and Tidwell with the index difference of Honea in order to suppress parasitic oscillations in the active media (Honea, [0006]).

With respect to claim 9, Byren, Tidwell and Honea teach the apparatus as outlined in the rejection to claim 8, and Byren and Tidwell further teach the medium to be disposed in the form of a layer on the lateral surface (see claim 1).

With respect to claim 10, Byren, Tidwell and Honea teach the apparatus as outlined in the rejection to claim 8, and Byren and Tidwell further teaches the reflector has a surface that diffusely reflects exiting pumping light (see claim 1).

Claims 1 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanson (US H1673) in view of Byren in view of Tidwell.

With respect to claims 1 and 11-12, Hanson teaches an apparatus for optically pumping a laser active solid body with pumping light coupled through an end surface of

Art Unit: 2828

the solid body, comprising: a laser active body (fig.2 #10) including an end surface through which pumping light is coupled (fig.2 #10 left side) into the solid body and a lateral surface through which pumping light exits the solid body (fig.2 top and bottom of #10, some light inherently lost through lateral surfaces), a housing surrounding the laser active solid state body at a distance from the lateral surface of the solid body for housing cooling fluid (water, col.3 lines 1-3), thereby forming an annular gap between the solid body and the housing. Hanson does not teach the housing surface to be reflective or diffusive. Byren teaches a solid media with reflective coated housing walls (fig.1). Tidwell teaches the use of a diffusive coating (pg.5 lines 1-6). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the housing of Hanson with the reflective coating of Byren to return lost light to the active media, and additionally to make the coating diffusive, as taught by Tidwell, in order to more evenly distribute the pumping light to the active material.

### ***Allowable Subject Matter***

Claims 3 and 6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 3 and 6 are allowable based on the fact that an end pumped laser system with a reflector spaced from the active media via an annular gap, having both the lateral

Art Unit: 2828

surface and the reflective surface being diffusive was not found to be taught in the prior art, or an obvious combination of the prior art. Namely, it was not found to be obvious to prepare not only the reflector or the lateral surface, but instead to coat both surfaces to provide the diffusive light to the active media.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.



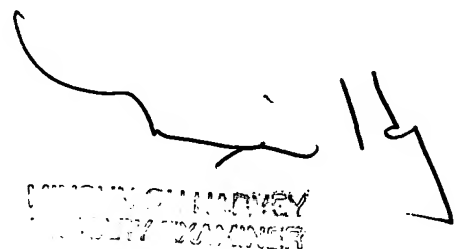
Art Unit: 2828

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TVR



Handwritten signature and stamp. The stamp reads: MINSUN HARVEY, SUPERVISOR, ART UNIT 2828.